PORTABLE WIRELESS DISPLAY DEVICE CAPABLE OF SETTING OPERATION MODES AND OPERATION METHOD THEREFOR

CROSS-REFERENCE TO RELATED APPLICATION

5   This application claims the benefit of Korean Patent Application No. 2003-50253, dated July 22, 2003, in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

10   1. Field of the Invention

The present invention relates to a portable wireless display device, and more particularly, to a portable wireless display device capable of setting operation modes and a mode setting/operation method therefor.

2. Description of the Related Art

15   In general, one carries out diverse kinds of information processings such as surfing the web, using emails, listening to music, watching videos, and so on, using personal computers at home.   In order to satisfy the necessity of users' diverse information processings as such, a portable display device capable of performing wireless communications, so called "Smart display" has been developed in recent.

20   Fig. 1 is a schematic block diagram for showing an information processing system having a portable wireless display device. The information processing system

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has a host 110, a portable display device 130, and a docking station 150 for docking the host 110 with the display device 130.

The portable wireless display device 130 as above has two types of platforms depending upon the docking structures thereof.

5   That is, if the portable wireless display device 130 undocks with the host 110, the portable wireless display device acts as a display device capable of performing wireless communications, enabling users to process information, such as surfing the web, using emails, listening to music, and so on, at any place they want without limitation to a specific place, for example, on sofas in the living room, kitchen counter, dining table, outdoor, and so on. In other words, if decided to be undocked at present, the portable wireless display device 130 executes a process for connecting to the host 110 so as to enable wireless communications with the host 110.

In the meantime, if the portable wireless display device 130 is mounted in the docking station 150 to connect to the host 110, the portable wireless display device 130 performs only a display function.

The conventional portable wireless display device 130 as above establishes an operation mode in correspondence with its docking structure. That is, the portable wireless display device 130 has a monitor mode for carrying out a display function when in a docking state, and a wireless monitor mode for carrying out a wireless communication-enabled display function when in an undocking state. For example, even when a user intends to only charge the portable wireless display device 130 in the wireless monitor mode, the portable wireless display device 130 mounted in the docking

station 150 is forced to be switched to the monitor mode regardless of the user's intent. Accordingly, inconvenience is caused since the user dismounts the portable wireless display device 130 in order to switch the device 130 to the wireless monitor mode and executes a process for connecting the device 130 to the host 110 again.

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SUMMARY OF THE INVENTION

Accordingly, it is an aspect of the present invention to provide a portable wireless display device capable of setting operation modes and an operation mode setting/operation method therefor.

10 In order to achieve the above aspect, a portable wireless display device docked/undocked with a docking station and capable of performing mutual communications with a host, according to the present inventrion, comprises an input unit for inputting a setting command to set an operation mode of the portable wireless display mode in a state that the portable wireless display device docks with the docking

15 station; a control unit for setting an operation mode corresponding to the setting command; and a storage unit for storing the set operation mode.

The operation mode includes a monitor mode for performing wired communications with the host and a wireless monitor mode for performing wireless communications with the host.

20 The portable wireless display device further comprises a display unit for externally displaying an operation mode setting window to set the operation mode,

wherein the control unit uses a predetermined program stored in the storage unit to display the operation mode setting window on the display unit.

Preferably, the input unit is at least one of an operation panel having plural keys, a keyboard, a mouse, and a touch panel.

5   In the meantime, an operation mode setting method for a portable wireless display device docked/undocked with a docking station and capable of performing mutual communications with a host, according to the present invention, comprises steps of inputting a setting command for setting an operation mode of the portable wireless display device in a state that the portable wireless display device docks with the docking

10   station; setting the operation mode corresponding to the setting command; and storing the set operation mode.

The operation mode includes a monitor mode for performing wired communications with the host and a wireless monitor mode for performing wireless communications with the host.

15   The operation mode setting method further comprises a step of externally displaying an operation mode setting window to set the operation mode, wherein the input step inputs the setting command based on the operation mode setting window.

Preferably, the input step inputs the setting command in use of at least one of an operation panel having plural keys, a keyboard, a mouse, and a touch panel.

20   Further, an operation method for a portable wireless display device docked/undocked with a docking station and capable of performing mutual communications with a host comprises steps of setting an operation mode of the

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portable wireless display device in a state that the portable wireless display device docks with the docking station; storing the set operation mode; and controlling the operations of the portable wireless display device in correspondence with the set operation mode.

5   The operation mode in the setting step includes a monitor mode for performing wired communications with the host, and a wireless monitor mode for performing wireless communications with the host.

Preferably, if the monitor mode is set in the setting step, the control step controls the portable wireless display device to perform wired communications with the host, and, if the wireless monitor mode is set in the setting step, the control step controls the portable wireless display device to perform wireless communications with the host.

More preferably, the operation mode in the setting step further includes a display mode for displaying a mode switchover display window, and the operation method further comprises steps of, if the display mode is set in the setting step, checking whether the portable wireless display device docks with the docking station; and displaying the mode switchover display window if the portable wireless display device docks with the docking station.

Accordingly, the portable wireless display device is prevented from mode switchovers that are not necessary nor intended by a user since the user sets an operation mode of the portable wireless display device. Therefore, the present invention can prevent the portable wireless display device from unnecessarily connecting to a host regardless of user's intent.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in detail with reference to the following drawings in which like reference numerals refer to like elements, and wherein:

5   Fig. 1 is a view for showing a schematic structure of an information processing system having a conventional portable wireless display device;

Fig. 2 is a schematic block diagram for showing a portable wireless display device according to an embodiment of the present invention;

Fig. 3a is a view for illustrating an operation mode setting window displayed on

10   the portable wireless display device of Fig. 2;

Fig. 3b is a view for illustrating a mode switchover display window out of an operation mode setting menu of the portable wireless display device of Fig. 2; and

Fig. 4a and Fig. 4b are flow charts each showing an operation process depending upon an operation mode set to the portable wireless display device of Fig. 2.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, the present invention will be described in detail with reference to the accompanying drawings.

Fig. 2 is a schematic block diagram for showing a portable wireless display

20   device capable of setting an operation mode according to an embodiment of the present invention.

The portable wireless display device has a communication unit 110, an input unit 120, an audio/video codec 130, a storage unit 140, a display unit 150, a switching unit 160, a docking connector 170, an audio codec 180, a control unit 190, and so on.

The communication unit 110 is a wireless module, such as a wireless LAN card, in which a protocol such as Remote Desktop Protocol (RDP) of the lowest hardware level is built to support wireless communications.

The input unit 120 has an operation panel 121, a USB connector 122, a touch panel 123, and so on.

The operation panel 121 is a panel provided with keys for manipulating the portable wireless display device, such as keys for manipulating electric power, volume, brightness, and the like, navigation keys, shortcut keys, and so on, in addition to a key corresponding to operation mode setting which will be later described, and the like.

The USB connector 122 is connected to an input device such as an USB keyboard, a mouse, and the like. In case that the portable wireless display device is dismounted, a user input data through the keyboard and the mouse connected to the USB connector 122.

The touch panel 123 processes a signal in accordance with a touch result, and the touch panel 123 is used as a user interface for an application program requiring a general mouse as in a web browser in general.

The audio/video codec 130 decodes audio/video data encoded in a predetermined format which is received through the communication unit 110, according to the controls of the central processing unit 193.

The storage unit 140 has a main memory 141 and a flash memory 143.

The main memory 141 stores commands, data, and so on, that the central processing unit 193 can instantly use, that is, the main memory 141 generally stores a main part of the operating system, a part or all of the application program, data in current use, and so on, in addition to an application program establishing operation modes which will be later described.

The flash memory 143 stores various application programs related to the function of a central processing unit 193, and also stores an application program for performing an operation mode setting.

The display unit 150 externally displays signal-processed video data, for which a portable TFT-LCD is generally used.

The switching unit 160 selectively switches the video data displayed on the display unit 150 according to the controls of the central processing unit 193. The video data outputted to the display unit 150 has two paths selected in correspondence with a docking structure of the portable wireless display device. That is, in case of the docking state, a path is used for outputting video data inputted from the docking connector 170, and, in case of the undocking state, another path is used for outputting video data received from the communication unit 110. Accordingly, the switching unit 160 selects a video data path according to the controls of the central processing unit 193 for an output depending upon the docking state.

The docking connector 170 provides an auxiliary processing unit 191 with state information depending upon whether the portable wireless display device docks or

undocks with a docking station (not shown). At this time, the auxiliary processing unit 191 checks a docking state, and provides the central processing unit 193 with the checked docking state, and the central processing unit 193 processes the overall operations of the portable wireless display device according to the docking state.

5   The audio codec 180 processes audio data according to the controls of the central processing unit 193. That is, the audio codec 180 outputs the processed audio signal to an audio output unit(not shown) such as speakers, headphones, and the like, or processes an audio signal inputted from an audio input unit(not shown) such as microphones and the like.

10   The control unit 190 has the auxiliary processing unit 191 and the central processing unit 193.

The auxiliary processing unit 191 may be a general co-processor, and a processing unit assisting the central processing unit 193. For example, the auxiliary processing unit 191 assists the processing of the central processing unit 193 with respect

15   to the data input and output through the operation panel 121, touch panel 123, docking connector 170, and so on. The central processing unit 193 processes and controls the overall operations of the portable wireless display unit.

Hereinafter, descriptions will be made on the operation mode setting for the portable wireless display device and the operation process in a set operation mode

20   according to the present invention with reference to Fig. 3 and Fig. 4.

The operation mode setting is performed, for example, through the "control panel-type setting" implemented in software, "operation mode setting key" implemented in hardware, and so on.

First, the "control panel-type setting" implemented in software is described as follows. That is, if a setting command for environment settings is inputted through a keyboard or a mouse connected to the touch panel 123 and/or the USB connector 122 which is provided on the input unit 120, the central processing unit 193 runs an application program for environment settings out of diverse application programs stored in the flash memory 143, and displays an image for the environment setting on the display unit 150.

In other words, as shown in Fig. 3a, the central processing unit 193 displays an environment setting window 300, and activates the operation mode setting window 310. The operation mode setting window 310 displays option menus for operation modes when the portable wireless display device is in the docking state.

For example, the option menus for the operation modes in the docking state include a "switch to monitor mode" 311 for setting the portable wireless display device to a monitor simply performing wired communications with the host, a "keep wireless monitor mode" 313 for setting the portable wireless display device to a wireless monitor performing wireless communications with the host without mode switchovers, and a "mode switchover display" 312 for displaying a mode switchover window, and so on.

That is, if the operation mode is set to the "switch to monitor mode", the central processing unit 193 sets the operation mode of the portable wireless display device to

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the monitor mode in case that the portable wireless display device docks with the docking station(not shown), and, if the operation mode is set to the "keep wireless monitor mode" 313, the central processing unit 193 keeps the operation mode of the portable wireless display device in the wireless monitor mode in order for the portable

5   wireless display device to operate in the wireless monitor mode even in case that the portable wireless display device docks with the docking station(not shown).

Further, if the operation mode is set to the "mode switchover display" 312, the central processing unit 193 displays a menu window 410 on which a user can select an operation mode in the on-screen display (OSD), as shown in Fig. 3b, if the portable

10   wireless display device docks with the docking station(not shown). Accordingly, the user sets the operation mode of the portable wireless display device to either a "monitor mode" 411 or a "wireless monitor mode" 413 according to the user's current situation.

In the meantime, shortcut keys are provided in hardware on the operation panel 121 to correspond to the monitor mode and the wireless monitor mode. For example,

15   using the shortcut keys such as a monitor mode key, a wireless mode key, and so on, a user sets the operation mode of the portable wireless display device through the shortcut keys in the docking state of the portable wireless display device. However, the shortcut keys may be separately provided as above, or only such functions may be set to existing keys.

20   Further, the above descriptions have been made on an instance in which a certain application program is used to display the operation mode setting window, such as

reference numeral 300 of Fig. 3a, for operation mode settings, but the operation mode can obviously set through a setting window in use of the on-screen display (OSD).

Fig. 4a and Fig. 4b are flow charts each showing an operation process according to an operation mode set to the portable wireless display device.

As aforementioned, if an operation mode is set through the input unit 120 in a software or a hardware fashion upon docking the portable wireless display device, the central processing unit 193 stores information on the set operation mode into the main memory 141, and controls the operations of the portable wireless display device in correspondence with the set operation mode. The operation process for the portable wireless display device is as follows.

The central processing unit 193 checks a set operation mode stored in the main memory 141(S411).

First, in case that the set operation mode is the "switch to monitor mode", the central processing unit 193 checks a current docking state based on docking state information transferred from the auxiliary processing unit 191(S415). The auxiliary processing unit 191 provides the central processing unit 193 with the docking state information based on an electric signal sent from the docking connector 170.

If the portable wireless display device is mounted in the docking station(not shown), the docking connector 170 sends an electric signal such as logic voltage "high" to the auxiliary processing unit 191. Further, if the portable wireless display device is not mounted in the docking station(not shown), the docking connector 170 sends an electric signal such as logic voltage "low" to the auxiliary processing unit 191. As such,

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the auxiliary processing unit 191 decides whether the portable wireless display device docks or undocks based on the electric signal provided depending upon the docking state of the docking connector 170 of the portable wireless display device with the docking station(not shown), and provides the central processing unit 193 with the corresponding docking state information.

The central processing unit 193 checks the docking state based on the docking state information provided from the auxiliary processing unit 191. As a result of the check, if the portable wireless display device docks with the docking station(not shown), the central processing unit 193 controls the portable wireless display device to perform only the monitor function (S421).

If the portable wireless display device undocks with the docking station (not shown) as a result of the docking state check (S417), the central processing unit 193 controls the portable wireless display device to operate in the wireless monitor mode (S419).

Next, if the set operation mode is the "keep wireless monitor mode" (S431), the central processing unit 193 operates the portable wireless display device in the wireless monitor mode regardless of the docking state information sent from the auxiliary processing unit 191 (S419). That is, even when the portable wireless display device is mounted in the docking station (not shown), the portable wireless display device operates in the wireless monitor mode if the operation mode is set to the "keep wireless monitor mode".

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In the meantime, if the set operation mode is the "mode switchover display", the central processing unit 193 checks the docking state based on the docking state information provided from the auxiliary processing unit 191 (S433). If the portable wireless display device docks with the docking station(not shown) as a result of the

5   check (S435), the central processing unit 193 produces in the OSD and displays an option menu window 410 on the display unit 150 as shown in Fig. 3b (S437). In here, the option menu window 410 has option menus such as "monitor mode" 411, "wireless monitor mode" 413, and so on.

The central processing unit 193 operates the portable wireless display device in

10   correspondence with an operation mode that a user selects. For example, if the user selects the "monitor mode" 411 (S439), the portable wireless display device mounted in the docking station operates in the monitor mode (S441), and, if the user selects the "wireless monitor mode", the portable wireless display device mounted in the docking station operates in the wireless monitor mode (S443).

15   Accordingly, the present invention can solve the problem of the conventional portable wireless display device having a uniformed operation mode depending upon the docking structure.

The present invention enables a user to set an operation mode of the portable wireless display device so as to prevent mode switchovers which are unnecessary or not

20   intended by the user. Accordingly, the present invention can prevent the portable wireless display device from unnecessarily connecting to a host regardless user's intent.

Although the preferred embodiments of the present invention has been described, it will be understood by those skilled in the art that the present invention should not be limited to the described preferred embodiments, but various changes and modifications can be made within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A portable wireless display device docked/undocked with a docking station, and capable of performing mutual communications with a host, comprising:

an input unit for inputting a setting command to set an operation mode of the portable wireless display mode in a state that the portable wireless display device docks with the docking station;

a control unit for setting an operation mode corresponding to the setting command; and

a storage unit for storing the set operation mode.

2. The portable wireless display device as claimed in claim 1, wherein the operation mode includes a monitor mode for performing wired communications with the host, and a wireless monitor mode for performing wireless communications with the host.

3. The portable wireless display device as claimed in claim 1, further comprising a display unit for externally displaying an operation mode setting window to